Licensable Technologies

CartaBlanca

R&D 100 2005 WINNER

Applications:

- Aerospace engineering
- Animation and special effects
- Computational fluid dynamics
- Fluid/solid interactions
- Automotive design
- Weapon/target interactions
- Pharmaceutical processing
- Homeland defense

Benefits:

- Provides accurate, physics-based computer simulations in Java
- Provides faster and lower-cost development
- Allows for easy modification and integration of code
- Runs on most hardware platforms without modification, from single PCs and Macs to parallel-processing supercomputers
- Increases software developer productivity
- Allows state-of-the-art simulations for complex reactive flows

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Technology Transfer Division

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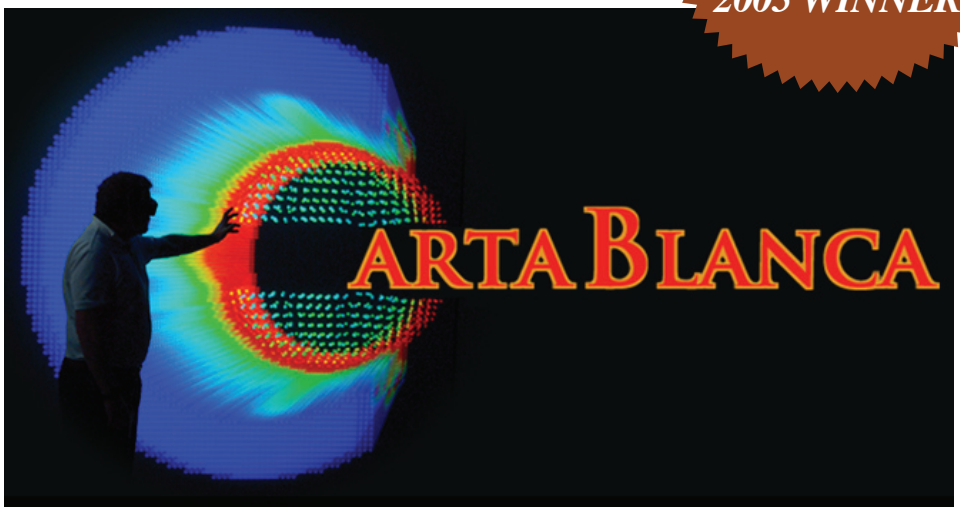

Shown is a simulation of an exploding cylindrical blast container. These containers are used to dispose of an improvised explosive device (IED). The simulation shows the motion of the broken IED hemispherical case, blast wave through the gas (air), and deflection and deformation of the cylinder. The colors show the different local particle pressures. These results are being visualized at LANL's RAVE (Reconfigurable Advanced Visualization Environment) facility, where scientists can see the data in a three-dimensional mode that provides greater insight into the details of the simulation.

Summary:

CartaBlanca brings the tremendous efficiency of the Java programming language to the world of scientific computing. CartaBlanca is a state-of-the-art, object-oriented simulation software package poised to offer next-generation modeling and simulation capabilities to scientists in a number of disciplines. Written in the developer-friendly Java language, it enables computer code developers to simulate complex nonlinear effects such as airflow through a turbo booster, blast effects on buildings, or heat transfer along a semiconductor. Because it is a Java-based software package, the code is much easier to use, manipulate, and modify than codes based on programming languages such as FORTRAN or C++. CartaBlanca takes advantage of the improved execution speed offered by the HotSpot™ compiler and opens up the field of physical modeling to a much broader set of programmers. CartaBlanca is modular and allows for rapid software application or simulation code prototyping; strong, extensive compiler checking; plug-and-play module insertion for modeling physical systems; solutions with consistent results; and integrated unit and regression testing.

Development Stage:

CartaBlanca is fully programmed in the easy-to-modify, object-oriented Java™ computer language. CartaBlanca consists of a series of "plug-and-play" modules. Together these modules

- Have a graphical user interface for easy programming;
- Utilize a variety of 2D and 3D unstructured grids for maximum realism; and
- Use as many different mesh elements (triangles, tetrahedra, etc.) as desired.

Intellectual Property Status: Copyright protected.

Licensing Status: Available for exclusive or non-exclusive licensing.

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